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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,694	10/03/2003	Robert S. Afzal	902.0129.U1(US)	9957

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EXAMINER

MENEFEE, JAMES A

ART UNIT PAPER NUMBER

2828

DATE MAILED: 05/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

8m

Office Action Summary	Application No. 10/678,694	Applicant(s) AFZAL ET AL.	
	Examiner James A. Menefee	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13, 25-34 and 36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 25-34 and 36 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of group I, claims 1-13, 25-34, and 36 in the reply filed on 3/14/2005 is acknowledged. Additionally, applicant has cancelled claims 14-24 and 35. Claims 1-13, 25-34, and 36 are pending.

Claim Objections

Claim 4 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to properly limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 1 initially requires that the "composite structure comprises end faces forming a ... resonant cavity therebetween [and] comprising at least partially reflecting coatings thereon." Therefore the cavity is formed by the end faces, and the reflecting coatings are formed on the end faces. Claim 4 then requires that the reflecting coatings are deposited on mirrors external to the cavity. Thus claim 4 requires that the reflecting coatings are formed not on the end faces that form the cavity, but on mirrors external to the cavity. Thus claim 4 does not include the reflecting coatings on the end faces, and does not include each and every limitation of the parent claim.

For examination purposes, claim 4 is interpreted to be in independent form including the limitations of claim 1, except not requiring that the reflecting coatings be deposited on the end faces.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 9, and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Ashby et al. (US 5,463,649). See Fig. 1.

Regarding claim 1, Ashby discloses a monolithic side pumped passively Q-switched solid state laser comprising a laser resonator composite structure comprised of a laser gain medium 14 optically contacting passive Q-switch 15, wherein the composite structure comprises end faces 16,18 forming a linear optical path therebetween, the end faces comprising at least partially reflective coatings deposited thereon, the gain medium comprising a side face for receiving pump light.

Regarding claim 2, the pump light is generated by laser diode array 12.

Regarding claim 9, the gain medium may be Er:glass. Col. 3 lines 64-67.

Regarding claim 34, the end faces 18,20 are substantially parallel and orthogonal relative to a longitudinal axis of the cavity.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ashby. Ashby discloses the limitations of the claims as shown above, but discloses the reflective coatings are on the composite structure rather than on external mirrors. However, it is certainly known that a typical laser has reflective coatings external to the laser composite structure, i.e. on mirrors. While not relied upon, see e.g. applicant's prior art figures. It would have been obvious to one skilled in the art to make the system using separate external mirrors as this facilitates easy adjustment/positioning/replacement of the individual pieces of the system, as is known in the art, as opposed to when mirrors are merely coated on the rod face.

Claims 3, 5-8, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashby in view of Nettleton et al. (Applied Optics, 20 May 2000 cited previously by applicant). Ashby discloses the limitations of the claims as shown above but does not disclose the following:

Regarding claim 3, Ashby does not disclose the pump light is a flashlamp. Nettleton discloses a similar side pumped laser having a flashlamp pump. Page 2429, col. 2. It would have been obvious to one skilled in the art to use flashlamp pumping because of cost considerations and broad temperature range, as taught by Nettleton.

Regarding claim 5, Ashby does not disclose a nonlinear material coupled to the composite structure. Nettleton discloses a similar laser and further discloses a nonlinear material coupled to the laser composite structure. It would have been obvious to one skilled in the art to

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include a nonlinear material because it can be used for frequency conversion of the laser, as taught by Nettleton.

Regarding claims 6 and 8, Nettleton's nonlinear material is an intracavity OPO. P. 2430 col. 1 first full par.

Regarding claim 7, it is not taught that the nonlinear material is external to the cavity. It is known in the art that nonlinear materials, such as harmonic generators or OPO's, may be incorporated either internal or external to a laser cavity, and it would have been obvious to one skilled in the art to use an external design via mere design choice.

Regarding claim 10, it is not disclosed that the Q-switch is Cr:YAG. Ashby does not disclose the materials of the Q-switch at all. Nettleton teaches a similar laser using a Cr:YAG Q-switch. It would have been obvious to one skilled in the art to use such materials for the Q-switch since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

Claims 11-13, 25-32 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashby in view of Polushkin et al. (US 5,432,811).

Regarding claims 11-13, 25, 27, 29, the limitations of the claims are disclosed as shown above by Ashby, but there is not disclosed the thermal aberration compensation means (as in claims 11, 25), and that those means are a tilt (as in claims 12, 27) or Porro prism (as in claims 13, 29).

Polushkin discloses a laser rod where the faces are at an angle of ninety degrees to each other and forty-five degrees to the axis of the rod. Col. 4 lines 32-35. This is by definition a Porro prism, and also may be considered a tilt. It would have been obvious to one skilled in the art to make the end face of a laser rod into such a shape in order to allow for higher mode operation, as taught by Polushkin. Col. 2 lines 52-61. While it is not disclosed that these are "thermal aberration compensation means" they are the same means as described by the applicant, and therefore it is inherent that they may be considered thermal aberration compensation means. Where the claimed and prior art structures are the same, claimed properties or functions, such as thermal aberration, are presumed inherent. See MPEP 2112.02.

Regarding claim 26, as shown above Ashby's composite structure includes a passive Q-switch.

Regarding claim 28, the particular tilt angle is not disclosed, though Polushkin appears to allow for a wide variety of shapes. It has been held that a mere change in size and shape, without changing the operation of the device or adding other significance, does not make a patentable distinction. See MPEP 2144.04(IV) and cases cited therein. Thus it would have been obvious to one skilled in the art to make a tilt at the particular angle as claimed as an obvious change of shape, since there is no evidence that the particular angle has any significance (indeed it is described in the specification only as "a typical angle." Page 12, par. [0050]).

Regarding claims 30-31, the laser of Ashby is monolithic and side pumped.

Regarding claim 32, it is not disclosed that the gain medium comprises saturable absorber material, yet such materials are known in the art. It would have been obvious to one skilled in the art to use such materials for the gain medium since it has been held to be within the general skill

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of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

Regarding claim 36, Ashby's end faces 18,20 are substantially parallel and orthogonal relative to a longitudinal axis of the cavity.

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ashby and Polushkin as applied to the claims above, and further in view of Nettleton. Ashby and Polushkin teach the limitations of the claims as above, but do not teach a nonlinear material coupled to the composite structure. Nettleton teaches this with motivation as in the rejection of claim 5 above.

Response to Arguments

Applicant's arguments filed 12/1/2004 regarding the Peterson reference are persuasive, therefore the prior rejections have been withdrawn. New grounds of rejections are presented above.

Conclusion

The Brown reference (US 6,115,400) is cited as it appears to show tilted face rod lasers.

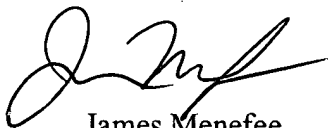
Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (571) 272-1944.

The examiner can normally be reached on M-F 8:30-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



James Menefee
May 25, 2005